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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Dieter Brueckner

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EXAMINER

GREY, CHRISTOPHER P

ART UNIT

PAPER NUMBER

2667

DATE MAILED: 10/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/812,570

Applicant(s)

BRUECKNER ET AL.

Examiner

Christopher P. Grey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 and 36-63 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 and 36-63 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 4, 5, 6, 11, 17, 18, 37, 38, 39, 44, 45, 46, 51, 57, 58, 59, 60, 61, 62, 63 are rejected under 35 U.S.C. 102(b) as being anticipated by Shimokawa et al. (US 4973953)

Claim 4 Shimokowa discloses a plurality of nodes (elements 12-17 in Fig 2) that are connected via bi-directional data transmission lines (elements 18 and 24 in fig 2).

Each node (coupling device) connects a number of segments (elements 18 or 19 in fig 1).

Each node includes a control circuit (detecting/blocking device) for detecting faults (Col 2 lines 37-47) and prohibiting (blocking) transmission or reception (Col 8 line 54-68).

Claim 5 Shimokowa discloses blocking upon the occurrence of an anomaly (Col 8 lines 54-68). Shimokawa also discloses blocking occurring for at least a period of time (minimum segmentation time) that it takes to send and receive a reset frame (Col 5 lines 39-44).

Shimokawa discloses each node containing a check circuit that sends a check frame during the idle time, and if a response is not received within that idle time blocking occurs (Col 4 lines 47-54 and Col 7 lines 14-22).

Claim 6 Shimkawa discloses prohibiting the forwarding of data upon the occurrence of a fault (single predetermined number of errors) as disclosed in Col 4 lines 41-46.

Claim 11, 51 Shimokowa discloses sending a check frame (control information) to either neighboring node when an anomaly is detected (Col 4 lines 47-54).

The neighboring node receives this check frame and determines whether it has been sent normally (quality of transmission).

Claim 17 Shimokowa discloses sending a reset frame (special message) from a faulty node indicating its recovery (good transmission quality). This reset frame is sent to all other nodes in order to resume connection of the link (Col 5 lines 39-44)

Claim 18, 58 Shimokowa discloses a node and its neighboring node performing a check and response procedure (handshake) to determine if the connection is normal (transmission quality).

Shimokowa discloses a node sending a check frame (first or third special message) to a neighboring node when an anomaly has been detected (Col 4 lines 47-54), where this anomaly is detected by a measure of the slot time (segmentation time) recorded by a built in timer (Col 8 lines 54-68).

Shimokowa discloses the neighboring node responding to the check frame with a check response (second or fourth special message) when normal conditions are experienced (Col 14 lines 47-54).

Shimokowa discloses if a response is not returned within a given time, prohibiting transmission or reception (Col 7 lines 28-52). Shimokowa also discloses a reset frame

(Col 5 lines 39-44), where it would have been obvious to one of the ordinary skill in the art at the time of the invention that a reset frame is generated based on the re-performing of the check frame.

Claim 44 Shimokowa discloses a plurality of segments (elements 18-23 in fig 2) in a network being connected by a number of devices (elements 12-17 in fig 2).

Each node includes a control circuit (detecting/blocking device) for detecting faults (Col 2 lines 37-47) and after, prohibiting (blocking) transmission or reception (Col 8 line 54-68) to the neighboring node in the direction where the fault was detected.

Each node includes a control circuit (detecting/blocking device) for prohibiting (blocking) transmission or reception (Col 8 line 54-68).

Claim 45 Shimokowa discloses blocking upon the occurrence of an anomaly (Col 8 lines 54-68). An anomaly is detected by a built in timer that measures a slot time (minimum segmentation time).

Shimikawa discloses each node containing a check circuit (monitoring) that sends a check frame during the idle time, and if a response is not received within that idle time blocking occurs (Col 4 lines 47-54 and Col 7 lines 14-22).

Claim 46 Shimokawa discloses prohibiting the forwarding of data upon the occurrence of a fault (single predetermined number of errors) as disclosed in Col 4 lines 41-46.

Claim 57 Shimokowa discloses sending a reset frame (special message) from a faulty node indicating its recovery (good transmission quality), which unblocks

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transmission or reception. This reset frame is sent in the event that a check frame responds normally (transmission quality). This reset frame allows a reconnection of the link (Col 5 lines 39-44).

Claim 37, 59 Shimokowa discloses an idle time equivalent to a slot time (Col 4 lines 59-61).

Claim 38, 60 Shimokowa discloses an idle time equivalent to a slot time (Col 4 lines 59-61) and a timer for determining an anomaly (exceeding minimum segmentation time) based on a measured slot time (Col 8 lines 54-68), where it would have been obvious to one of the ordinary skill in the art at the time of the invention to set a minimum segmentation time greater than the idle time.

Claim 39, 61 Shimokowa discloses a slot time that is calculated (predetermined) before a determination is made (Col 6 lines 25-40).

Claim 62 Shimokowa discloses each control circuit (device) for a node containing transmission data TXD (Col 9 lines 10-26), received data RXD (Col 9 lines 31-56) and a memory for storing commands, which is inherent. Shimokawa also discloses the control circuit sending a command to prohibit transmission or reception on the event of a fault (Col 8 lines 54-68).

Claim 63 Shimokowa discloses a clock pulse for performing synchronization (compensation) to transmission data, and the time for each one bit (Col 9 lines 10-26 and see fig 9).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perreault et al. (US 5805586) in view of Stewen (Engineering and Automation Vol 17 May-Aug. 1995)

Claim 1 Perreault et al. (Perreault 'hereinafter') discloses a control station (coupling device) connected to a plurality of tributary devices. Perreault discloses a time out timer (measuring device) for detecting a timeout (slot time) when a poll (GAP query) is not responded in time (Col 3 lines 29-37 and see fig 1), where it would have been obvious to one of the ordinary skill in the art at the time of the invention to use this timer to measure predetermined slot times. Perreault discloses the normal poll processing flow (cyclical check) as seen in Fig 4. Perreault discloses a protocol (Col 2 lines 41-51), but does not disclose a PROFIBUS DB protocol.

Stewen discloses PROFIBUS DB protocol (no. 3-4, pg 13-14) used within a bus and ring configuration, wherein comprehensive monitoring facilitates high levels of operational reliability. It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the bus structure and protocol disclosed by Perreault with the PROFIBUS protocol disclosed by Stewen in order to monitor the bus segments and nodes connected to it for continuous presence on the network (Col 2 paragraph 3).

Claim 2 Perreault discloses a control station (active user) polling (GAP queries) with a plurality of devices (non-existent user) as disclosed in Col 3 lines 19-27.

Claim 3 Perrault discloses a time out time (predefined slot time) that is inherently greater than the maximum time to send a poll and receive a response to that poll. It would have been obvious to one of the ordinary skill in the art at the time of the invention to make the time out time twice that of the maximum time to send a poll.

Claim 36 Perreault discloses measuring a time (slot time) it takes for a poll response (GAP query) to be received from a tributary station (Col 3 lines 29-37 and see fig 1).

3. Claims 9, 10, 49 and 50 rejected under 35 U.S.C. 103(a) as being unpatentable over Shimokawa et al. (US 4973953) in view of Weiss (US 4501021)

Claim 9 and 49 Shimokawa does not disclose detecting corruption if more than a predefined number of characters are contained in a received message, however, Weiss discloses a maximum frame (character) size for detecting errors (faults). It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the teachings of Shimokawa with the error detecting disclosed by Weiss to enhance error-detecting capabilities (Col 3 lines 46-64).

Claim 10 and 50 Shimokawa does not disclose a predefined number of characters being 262, however Weiss discloses 272 byte frames as a maximum (predefined) frame size (Col 3 lines 46-64). It would have been obvious to one of the ordinary skill in the art at the time of the invention was made to have a predefined number of characters being

262, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)

4. Claims 12, 13, 14, 15, 16, 52, 53, 54, 55, 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimokawa et al. (US 4973953) in view of Newton's Telecom Dictionary (14th and expanded Edition, March 1998)

Claim 12, 14, 52, 54 Shimokawa discloses a check frame being sent, but does not specifically disclose a CRC frame, however it would have been obvious to one of the ordinary skill in the art at the time of the invention to send a CRC frame (claim 14 and 54). Shimokawa does not disclose comparing the control information with the received control information and indicating an error in case of a mismatch.

Newton's Telecom Dictionary defines CRC as a process where a CRC character generated is compared to a character in the receiving node, and if there is a difference notifying the sender (page 187).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the check frame disclosed by Shimokawa with the CRC character disclosed by Newton's Telecom Dictionary. The motivation for this modification is to determine if the data was correctly received (page 187).

Claim 13, 53 Shimokawa discloses a node prohibiting the forwarding of messages to a neighboring node in the event of a fault, but does not specifically disclose in the event of a mismatch, however Newton's Telecom dictionary discloses

notifying the sender in the event that there is a difference in the CRC characters (page 187).

Claim 15, 55 Shimokowa discloses a check frame being sent, where it would have been obvious to one of the ordinary skill in the art to send a CRC frame. Shimokowa does not disclose the CRC character comprising 5 bits.

Newton's Telecom Dictionary defines CRC character as having a value dependant on the number of ones in a data block (page 187), where it would have been obvious to one skilled in the art at the time of the invention to have a CRC character with a value comprising any number (5 bits) of bits.

Claim 16, 56 Shimokowa discloses a node sending a check frame to a neighboring node, where a check frame is sent by means of a code that does not appear in ordinary transmission (Col 4 line 64- Col 5 line6), where it would have been obvious to one of the ordinary skill in the art at the time of the invention to include a stop bit at the beginning of that code.

5. Claims 7, 8, 47, 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimokawa et al. (US 4973953) in view of Schrock (US 4648123)

Claim 7, 47 Shimokowa discloses detecting a fault, but does not disclose detecting if a signal level in a received message persists longer than a predetermined time. However, Schrock discloses waiting for a predetermined period of time and then sampling and measuring a signal level (Col 3 lines 49- Col 4 line 3).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the control circuit (detecting device) disclosed by Shimokawa, with the sampling and measuring of the signal level as disclosed by Schrock. The motivation for this modification is to allow rapid and reliable communication between terminals (Col 2 lines 15-44).

Claim 8, 48 Shimokawa discloses detecting a fault, but does not disclose detecting if a signal level remains on a low level for 13 consecutive bit times. However, Schrock discloses waiting for a predetermined period of time and then sampling and measuring a signal level (Col 3 lines 49- Col 4 line 3), where it would have been obvious to one skilled in the art at the time of the invention that a predetermined time is equivalent to 13 consecutive bit times.

6. Claims 40, 41, 42, 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimokawa et al. (US 4973953) in view of Perreault et al. (US 5805586) in further view of Stewen (Engineering and Automation Vol 17 May-Aug. 1995)

Claim 40 Shimokawa discloses a built in timer for measuring a slot time (Col 4 lines 12-26), however Shimokawa does not disclose using GAP queries with which active users using a PROFIBUS DP protocol for data transmission cyclically check whether new users have been connected to the network.

Perreault discloses detecting a timeout (slot time) when a poll (GAP query) is not responded in time (Col 3 lines 29-37 and see fig 1). Perreault discloses the normal poll

processing flow (cyclical check) as seen in Fig 4. Perreault discloses a protocol (Col 2 lines 41-51), but does not disclose a PROFIBUS DB protocol.

Stewen discloses PROFIBUS DB protocol used within bus and ring configurations wherein comprehensive monitoring facilitates high levels of operational reliability (no. 3-4, pg 13-14). It would have been obvious to one of the ordinary skill in the art at the time of the invention to combine the teachings of Shimokowa and Perreault, who disclose a blocking device and timer for measuring poll time, with the PROFIBUS protocol disclosed by Stewen in order to monitor the bus segments and nodes connected to it for continuous presence on the network (Col 2 paragraph 2).

Claim 41 Shimokowa does not disclose a predefined slot time being a time for which an active user waits after a GAP query for a reply message from a polled user.

Perreault discloses measuring a time (slot time) it takes for a poll (GAP query) response to be received from a tributary station (Col 3 lines 29-37 and see fig 1).

Claim 42 Shimokowa does not disclose one active user configured to execute cyclical GAP queries. Perreault discloses a control station (active user) polling (GAP queries) with a plurality of devices (non-existent user) as disclosed in Col 3 lines 19-27.

Claim 43 Shimokowa does not disclose a predefined slot time being twice that of a maximum time it takes to send a GAP query and receive a reply.

Perrault discloses a time out time (predefined slot time) that is inherently greater than the maximum time to send a poll and receive a response to that poll. It would have been obvious to one of the ordinary skill in the art at the time of the invention to make the time out time twice that of the maximum time to send a poll.

Response to Arguments

7. Applicant's arguments filed July 8, 2005 have been fully considered but they are not persuasive.

(a) The applicant argued that the cited art does not disclose, "the second coupling device blocks the forwarding to the third segment of messages received in the second segment upon detection of a block of the forwarding of messages by the first coupling device".

The examiner maintains that the same limitation, in its broadest term is already discussed in the rejection of claim 4, 44, wherein Shimokawa discloses within the background of the invention a node that has detected a fault, issuing a command to relevant adjacent nodes, forbidding them to receive or transmit (Col 1 lines 45-49). Furthermore, Shomokawa discloses detecting an anomaly, and blocking reception or transmission to particular segments (Col 7 lines 28-52).

(b) The applicant argued that the cited art does not disclose the applicants claimed blocking the sending of messages based on idle time.

The examiner maintains that the limitation in its broadest term is already discussed in the rejection of claim 5, wherein Shimokawa discloses a control circuit which determines if a response is received within a given time, where if not, prohibition occurs (Col 10 lines 10-50). Shimokowa also discloses the check frames and their responses being carried out during idle times (Col 7 lines 14-19).

(c) The applicant argued that the cited art does not disclose the applicants claimed, the forwarding of messages is blocked after a predetermined number of errors.

The examiner maintains that the same limitation has already been disclosed within the rejection of claim 6, wherein Shimokowa discloses blocking transmission in the event of a single fault occurring (Col 5 lines 14-25).

(d) The applicant argued that the cited art does not disclose the applicants claimed, supplement message.

Shimokowa discloses sending a check frame and the neighboring node receives this check frame and determining whether it has been sent normally (quality of transmission).

(e) The applicant argued that the cited art does not disclose the applicants claimed, special message.

Shimokowa discloses a reset frame being sent by a node to its neighbouring nodes, where a reset frame indicates that a nodes blocking has been negated, thus transmission quality is good enough to restart reception and transmission (inherent and see rejection of claim 11).

(f) The applicant argued that the cited art does not disclose the applicants claimed four messages.

The examiner maintains that the same limitation has already been disclosed in the rejection of claim 18, wherein Shimokowa discloses a check frame, a response, a reset frame and a response as disclosed in the rejection of claim 18.

(g) The applicant argued that the cited art does not disclose the applicants claimed minimum segmentation time.

The examiner maintains that the same limitations is disclosed within the scope of the rejection of claim 18, wherein Shimokowa discloses prohibiting transmission until a reset frame is issued, where the time for a reset frame is equivalent to a minimum segmentation time.

(h) A response to the arguments for claim 37 are discussed in combination above.

(i) The applicant argued that the cited art does not disclose 262 characters.

The examiner maintains that the same limitation is already discussed within the rejection of claim 10, 49 and 50, wherein Weiss discloses a predefined number of characters. It would have been obvious to one of the ordinary skill in the art at the time of the invention that the predefined number may be set to 262, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA). Furthermore, any number of error detecting method may be combined in order to achieve thorough error detection.

- (j) The applicant argued that there is no motivation for the use of a CRC frame.

The examiner maintains that the same limitation is already disclosed in the rejection of claims 12 and 14, wherein a CRC (cyclic redundancy **check**) data is equivalent to a check frame. Furthermore, Shimokowa discloses comparison as disclosed in Col 10 lines 10-50, where received code is compared to the expected value of 1110.

- (k) The applicant argued that the cited art does not disclose the applicants, "detecting device detects corruption if a signal level in a received message persists longer than a predefined time"

The examiner maintains that the same limitation is contained within Schrock, disclosing polling over a period of time, after which signal level detecting is performed. If a signal level breaches a desired range over the period of time, indicating corruption, an adjustment signal is applied. Furthermore, Shimokowa does not teach away from node supervision, however teaches away from one node performing the supervision.

- (l) The applicant argued that the cited art does not disclose the applicants claimed, "checking if new users have been connected to the network"

The examiner maintains that the same limitation has already been disclosed within the rejection of claims 40, 41 and 43, wherein Perreault discloses sending polls, where a poll response is an indication that a new user has been connected (Col 3 lines 29-37 and see fig 1), where it would have been obvious to one of the ordinary skill in the

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art at the time of the invention that if a timeout exists, a predefined time for transmitting the poll exists.

(m) The applicant argued that the cited art does not disclose the applicants claimed, "coupling device" and "slot times".

The examiner maintains that the same limitation in its broadest term is already disclosed within the rejection of claim 1, where Perreault discloses the control station coupled to a number of devices. It would have been obvious to one of ordinary skill in the art at the time of the invention that if each device is coupled to the controller, they are also inherently coupled to one another. Furthermore, Perreault measures a timeout, which is a predefined period of time, where it would have been obvious to one of ordinary skill in the art at the time of the invention that any predefined time may be equivalent to a predefined slot time.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to

(a) Engbersen (US 5271000) discloses detecting errors in a system where CRC is used, and a number of predefined errors are detected.

(b) Jippo (US 6357033) discloses a control apparatus sending CRC data to a number of communication processing stations in order to detect a fault.

9. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher P. Grey whose telephone number is (571)272-3160. The examiner can normally be reached on 6:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on (571)272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christopher Grey
Examiner
Art Unit 2667

C. Grey
10/19/05


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